I. EXECUTIVE SUMMARY

Petition History

On July 28, 2000, the Fish and Game Commission (Commission) received a petition to list coho salmon north of San Francisco as an endangered species under provisions of the California Endangered Species Act (CESA). The Commission referred the petition to the Department of Fish and Game (Department) on August 7, 2000, for evaluation.

The Department found that the information in the petition was sufficient to indicate the action may be warranted and recommended the Commission accept the petition. The petition was accepted by the Commission on April 5, 2001. On April 27, 2001 the Commission published a Notice of Findings in the California Regulatory Notice Register declaring coho salmon a candidate species, thereby starting the candidacy period.

The Department solicited information and undertook a status review of the species using the best scientific information available. This report contains the results of the Department's status review and recommendations to the Commission. The Department evaluated the status separately for the two coho salmon Evolutionarily Significant Units (ESU) that occur in California: Southern Oregon/Northern California Coast Coho ESU (SONCC Coho ESU - those populations from Punta Gorda north to the Oregon border) and the Central California Coast Coho ESU (CCC Coho ESU - those populations from San Francisco Bay north to Punta Gorda). This approach is consistent with previous listings, the federal approach to species' evaluation, and the generally accepted biological criterion that a species is "a group of interbreeding organisms that is reproductively isolated from other such groups."

Conclusions

The Department did not find any evidence to contradict the conclusions of previous status reviews that coho salmon populations have suffered declines in California. Conversely, new evidence was found that supports these conclusions. The Department concludes that California coho salmon have experienced a significant decline in the past 40 to 50 years. California coho salmon populations have been individually and cumulatively depleted or extirpated and the natural linkages between them have been fragmented or severed. Previous studies have shown that coho salmon abundance in California, including hatchery stocks, could be six to 15 percent of their abundance during the 1940s, and has experienced a decline of at least 70% since the 1960s.

With two exceptions, California hatchery coho salmon stocks have also experienced drastic reductions in recent years due to low spawner abundance. The two exceptions are the Department's Iron Gate and Trinity River hatcheries. Both of these facilities experienced variable adult returns but generally met production quotas in recent years. Upstream of the South Fork of the Trinity River, natural spawning appears to be low and the proportion of hatchery origin fish seems to be high.

Coho salmon harvest dropped-off considerably in the late 1970s, despite a fairly stable rate of hatchery production. By 1992, ocean stocks were perceived to be so low that the commercial fishery in California was closed. Similarly, coho salmon retention in the ocean sport fishery ended with the 1993 season.

Southern Oregon/Northern California Coast Coho ESU

The analysis of presence-by-brood-year data indicates that coho salmon now occupy only about 61% of the SONCC Coho ESU streams that were previously identified as historical coho salmon streams. However, these declines appear to have occurred prior to the late 1980s and our data does not support a significant decline in distribution between the late 1980s and the present. This analysis and the 2001 presence surveys indicate that some streams in this ESU may have lost one or more brood-year lineages.

The 2001 presence survey data also show a decline in reported distribution in this ESU. These data show a substantial reduction in the number of historical streams occupied by coho salmon, especially for the Mattole, Eel, and Smith river systems, where coho salmon appeared to be absent from 71%, 73%, and 62% of the streams surveyed, respectively. These data should be interpreted with caution, however, because they represent only one year of surveys, and 2001 was a drought year on the north coast. Nevertheless, the inability to detect coho salmon in streams where they were historically documented to occur and that are considered by biologists to contain suitable coho salmon habitat is significant, especially to the high degree that coho salmon were not found in these surveys (59% of all the streams surveyed).

Adult coho salmon counts at Benbow Dam on the South Fork Eel River show a substantial decline in coho salmon abundance in this system starting in the mid-1940s. Most other trend indicators for streams in the area show declining or stable trends.

Although streams supporting coho salmon in the California portion of the SONCC Coho ESU appear to be fewer now in comparison to the 1985-1991 period, the available data suggest that population fragmentation within the larger river systems is not as severe as in the CCC Coho ESU. All major stream systems within the California portion of the SONCC Coho ESU still contain coho salmon populations. Also, the presence-by-brood-year analysis indicates that the decline in the number of streams supporting coho salmon appears to have stabilized since the mid-1980s. For these reasons, the Department concludes that the California portion of the SONCC Coho ESU is not presently threatened with extinction. However, because of the decline in distribution prior to the 1980s, the possibility of a severe reduction in distribution as indicated by the field surveys, and the downward trend of most abundance indicators, the Department believes that coho salmon populations in the California portion of this ESU will likely become endangered in the foreseeable future in the absence of the protection and management required by CESA.

Central California Coast Coho ESU

The 2001 presence surveys in the northern portion of the CCC Coho ESU show a level of occupancy of historical streams that is similar to the SONCC Coho ESU. However, stream systems south of Mendocino County show a much greater proportion of streams in which coho salmon were not found. These surveys and other recent monitoring data indicate that widespread extirpation or near-extinctions have already occurred within some larger stream systems (e.g. Gualala and Russian rivers) or over broad geographical areas (e.g. Sonoma County coast, San Francisco Bay tributaries, streams south of San Francisco).

Most abundance trend indicators for streams in the CCC Coho ESU indicate a decline since the late 1980s. However, some streams of the Mendocino County coast show an upward trend in 2000 and 2001. Time-series analysis for these streams show a declining trend and predict that this trend will continue, despite the recent increases.

There is anecdotal evidence that relatively large numbers of coho salmon adults returned to some Marin County streams in 2001, and some of these streams, such as Lagunitas Creek, appear to have relatively stable populations. However, these populations are more vulnerable to extinction due to their small size, and the spatial isolation of this region due to extirpation of coho salmon populations to the north and south.

Coho populations in streams in the northern portion of this ESU seem to be relatively stable or are not declining as rapidly as those to the south. However, the southern portion, where widespread extirpation and near-extinctions have occurred, is a major and significant portion of the range of coho salmon in this ESU. Small population size along with large-scale fragmentation and collapse of range observed in data for this area indicate that metapopulation structure may be severely compromised and remaining populations may face greatly increased threats of extinction because of this. For this reason, the Department concludes that CCC coho salmon are in serious danger of extinction throughout all or a significant portion of their range

Factors Affecting the Decline

The severity of the decline and number of extirpated populations increases as one moves closer to the historical southern limit of the coho salmon range, indicating that freshwater habitat in these marginal environments is less able to support coho salmon populations than in the past. Freshwater habitat loss and degradation has been identified as a leading factor in the decline of anadromous salmonids in California and coho salmon do not appear to be an exception to this trend. Timber harvest activities, especially past and present road construction, have had deleterious effects on coho salmon habitat. Diversion of water for agricultural and municipal purposes and dams that block access to former habitat have resulted in further reduction of habitat. Water quality in historical coho salmon streams has degraded substantially, as evidenced by the number of north- and central-coast streams that have been placed on the list of impaired water bodies, pursuant to section 303 of the Clean Water Act (CWA).

Recommendations

The Department concludes that the listing of the California portion of the SONCC Coho ESU as endangered is not warranted, but listing as threatened is warranted. The Department recommends that the Commission add coho salmon north of Punta Gorda to the list of threatened species.

The Department concludes that coho salmon in the CCC Coho ESU is in serious danger of becoming extinct throughout all or a significant portion of its range. The Department concludes that listing this species as an endangered species is warranted. The Department recommends that the Commission add coho salmon north of, and including, San Francisco Bay to Punta Gorda to the list of endangered species.